W. HOLDSWORTH.

LOCOMOTIVE.

No. 183,566. Patented Oct. 24, 1876.

Fig. 7.

Fig. 1.

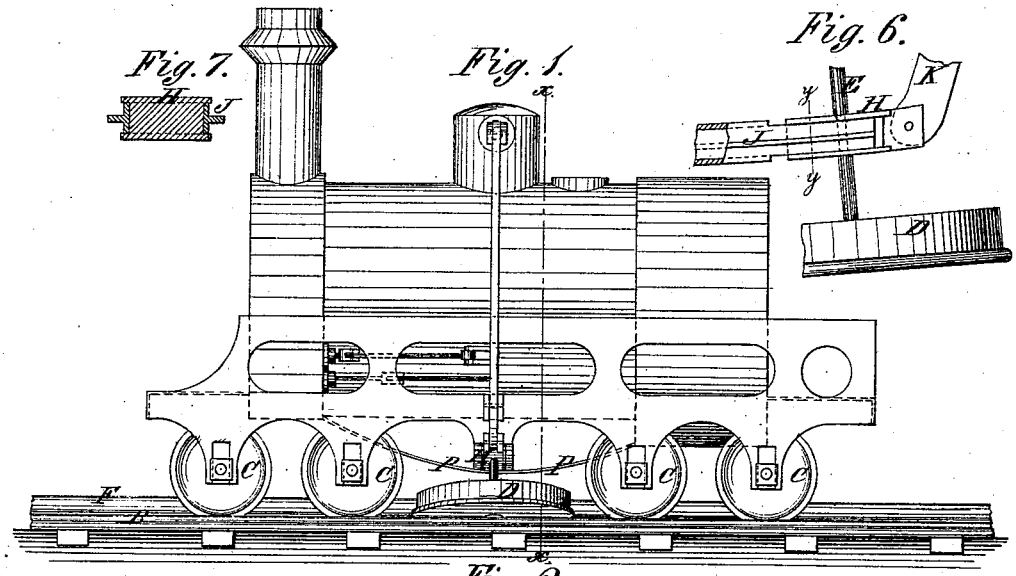


Fig. 6.

Fig. 2.

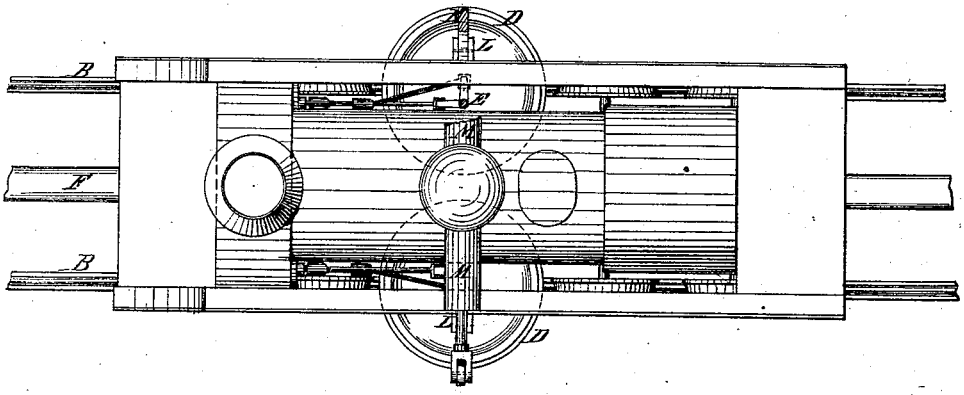


Fig. 3.

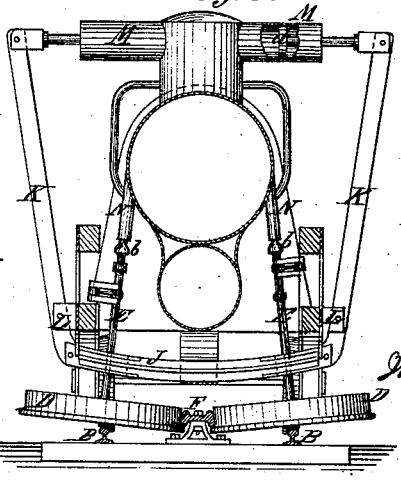


Fig. 5.

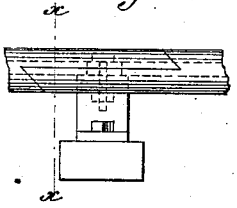
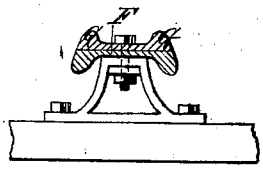


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM HOLDSWORTH, OF TRAVERSE CITY, MICHIGAN.

IMPROVEMENT IN LOCOMOTIVES.

Specification forming part of Letters Patent No. **183,566**, dated October 24, 1876; application filed May 16, 1876.

To all whom it may concern:

Be it known that I, WILLIAM HOLDSWORTH, of Traverse City, county of Grand Traverse and State of Michigan, have invented a new and Improved Traction-Engine, of which the following is a specification:

My invention is an improvement in the class of locomotives provided with wheels mounted on vertical axes and adapted to work in contact with a rail laid equidistant between the parallel rails, upon which the locomotive is supported in the usual way.

The improvement relates particularly to the construction and arrangement of parts for varying the pressure of the driving-wheels upon the central friction-rail, and for guiding and supporting said wheels while permitting their lateral and vertical adjustment, as hereinafter described.

Figure 1 is a side elevation of a locomotive-engine constructed according to my invention. Fig. 2 is a plan view. Fig. 3 is a transverse section taken on line *x x*, Fig. 1. Fig. 4 is a transverse section of the rail to be used for the application of such wheels, the section being taken on line *x x* of Fig. 5. Fig. 5 is a side elevation of a section of the middle rail, and Figs. 6 and 7 are details of the axle-bearings of the driving-wheels.

Similar letters of reference indicate corresponding parts.

The locomotive runs on the ordinary rails B, by the truck-wheel C, but the driving-wheels D are mounted on the nearly-vertical axles E, so as to run against opposite sides of a middle rail, F, having two heads, G, so that the traction can be increased when required by pressing the driving-wheels against the rail with great force. In order to accomplish this I have mounted the axles just above the wheel in a box, H, which is capable of sliding toward and from the rail in the beam J, and is pushed toward it by the lever K, which also supports the end of the bearing, the lever being supported on the fulcrum L, and at the upper end being connected with a piston, *a*, in a cylinder, M, to which steam is to be admitted from the boiler whenever the wheel is to be pressed on the rail. The upper end of the axle is fitted by a universal joint, *b*, to a piston in a cylinder, N, attached to the boiler, and to contain a spring or springs of metal or other material, but preferably steam, to keep the driving-wheels from lifting the rail when the locomotive jolts up and down. A supporting-spring, P, is fixed under the boiler to mainly support the beam J, in which the lower boxes of the crank-shafts are mounted.

The driving-axles will be turned by two engines attached to each. The rail F will, by preference, be constructed of two parts to be joined horizontally, as represented in Fig. 4, and the parts will be spliced, as shown in Fig. 5.

The valve mechanism for admitting and exhausting steam from the cylinders M and N may be of any approved arrangement, and will be under the control of the engineers.

Other means may be employed for working the levers K—for instance, screws, cams, or eccentrics, to be worked by the engineer—but steam or compressed air affords the best and most powerful means.

This method of driving is applicable to machines on runners in place of the truck-wheels, a wire rope being used instead of the middle rail for the traction-wheels.

I do not claim, broadly, the employment of driving-wheels adapted to be adjusted laterally to vary their pressure upon a central rail; but

What I claim as new is—

1. The combination of the pivoted levers K, horizontal cylinders M, and pistons *a*, and the driving-axles, as shown and described, to operate as specified.

2. The combination of driving-axles, levers K, guide J, and spring P, as shown and described.

WILLIAM HOLDSWORTH.

Witnesses:

W. T. STEWARD,

C. K. BUCK.